

# THE NATURALIST.

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## MAN.

GRAND DIVISION—*Vertebralia*. CLASS—*Mammalia*. ORDER—*Bimanum*.  
GENUS—*Homo*. SPECIES—*Sapiens*.

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'The proper study of mankind is man.'  
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MAN, by his form and the perfection of his organs, and as the only being on earth endowed with reason, seems properly placed at the head of the kingdoms of nature. All in man announces him the lord of the earth; his external conformation, his erect stature, and his majestic height, mark his superiority over all the other living beings of the earth. He is the only being adapted by his organization to go erect. Enslaved to their senses, and partaking merely of physical enjoyments, other animals have their heads directed towards the earth; but man, whose more elevated nature is connected to surrounding objects by moral relations, who can pursue the uninterrupted successions of causes and effects, can embrace in his mind the system of the universe, boldly regards the heavens, and can direct his sight even into the starry regions. On his face is imprinted the character of dignity; the image of his soul is painted upon his features, and the excellence of his nature penetrates through his material organs, and animates the expression of his countenance. In the diversity of the regions which he is capable of inhabiting, he holds the first place among animals. His frame and nature are stronger and more flexible than those of any other creature; hence he can dwell in all situations on the surface of the globe. The

neighborhood of the pole and the equator, high mountains and deep vallies are occupied by him. His strong but pliant body bears cold, heat, moisture, light or heavy air; he can thrive anywhere, and runs into less remarkable varieties than any other animals which occupy so great a diversity of abodes—a prerogative so remarkable, that it is worthy of the attention of every observer.

The situations occupied by our species in the present times, extend as far as the known surface of the earth. The Greenlanders and Eskimaux have reached between 70 and 80° of N. latitude, and Danish settlements have been formed in Greenland in the same high latitude. Three Russians lived between six and seven years on Spitzbergen, between 77 and 78° of N. latitude. The Negro lives under the equator; and all America is inhabited from the northern regions of eternal frost, even to the southern extremity of Terra del Fuego. Thus we find that man can exist and propagate his species in the hottest and coldest countries of the earth.

The greatest natural cold ascertained by thermometrical measurement was that experienced by the elder Gmelin, in 1735, at Jeniseik; the mercury froze in the thermometer; the sparrows and jays all died. When Pallas was at Krasnoiarsk the mercury also froze in the ball of the thermometer, and a large mass of pure mercury froze in the open air. The Canadian savages and the Eskimaux go the chase in the regions of Churchhill River and Hudson Bay, in a temperature so cold that brandy will be frozen in the rooms where they have fires; and the inhabitants of the countries visited by Gmelin and Pallas, cannot remain in their houses during the winter. Even Europeans, accustomed to warmer climates, can resist such cold as mentioned above without injury, by taking sufficient exercise. The Danes have lived in Greenland in 72° N. latitude; and the Dutch, under Heemskerk, wintered at Nova Zembla in 76° N. latitude. Some of them perished; but those who took sufficient exercise, and were in good health at first, withstood the dreadful cold which the polar bear, apparently born for these climes, seems to have been incapable of supporting; for their journal states, that no sooner had the sun sunk below the horizon, than that the intensity of the cold was increased, and the bears went away, leaving the white foxes alone to brave the piercing cold of the arctic night; and that as soon as the sun re-appeared, the foxes went away and the bears returned. We have another example, in which three men remained between six and seven years in 78° of N. latitude.

The power of the human body to withstand severe cold will appear in a more remarkable light, when we observe what heat it is capable of bearing. Boerhaave asserts, that a temperature of  $96^{\circ}$  or  $100^{\circ}$  would be fatal to man. The mean temperature of Sierra Leone is  $84^{\circ}$  F.; Messrs. Watt and Winterbottom saw the thermometer frequently at  $100^{\circ}$ , and even  $102$  and  $103^{\circ}$  in the shade, at some distance off the coast. Adanson saw it at  $108\frac{1}{2}^{\circ}$  in the shade at Senegal, in  $17^{\circ}$  N. latitude; and Buffon cites an instance of its being seen at  $117\frac{1}{2}^{\circ}$ . The country to the west of the Great Desert may be still hotter than Senegal, from the effect of the winds which have swept over the whole tract of its burning sands. Dr. Chalmers observed a heat of  $115^{\circ}$  in South Carolina, in the shade; and Humboldt, of  $110$  to  $115^{\circ}$  in the Llanos or deserts near Orinoco in South America. And man has been known, by artificial means, to withstand a temperature, for a considerable length of time, sufficient to cause water to boil, or meat to roast, without material injury.

Thus man can support all possible degrees of atmospherical heat and cold; he has also an equal power of supporting varieties of pressure. The ordinary pressure of the atmosphere, at the level of the sea, may be reckoned at 32,325 pounds for the whole surface of the body of a common man, supposing the barometer at 30 inches. By ascending to a height of 12,000 feet, of which elevation extensive tracts, inhabited by thousands, are found in South America, the barometer stands at  $20\frac{1}{2}$  inches, and the pressure is 21,750 pounds. Condamine and Bouguer, with their attendants, lived three weeks at a height of 14,604 French feet, where the barometer stood at  $15\frac{3}{4}$  inches, where the pressure must consequently have been 16,920 pounds. The hamlet of Antisana, 13,500 feet above the level of the sea, is the highest inhabited spot on the surface of our globe; but Humboldt ascended Chimborazo to 19,300 feet. There are no instances of men living under a pressure much greater than what has been mentioned; the depths to which the earth has been penetrated in the operations of mining, are trifling in this point of view.\* In diving, however, the body is subject to, and can bear several atmospheres; as, on the contrary, in balloons men have probably ascended beyond any point of elevation on the surface of the earth, and have consequently been exposed to a much more considerable diminution of the ordinary pressure than what has been stated above.

\* The salt mine in Fruttenburgh, Bohemia, is 3000 feet deep.

As the physical capabilities of his frame enable him to occupy every variety of climate, soil and situation, it follows of necessity, that he must be omnivorous, that is, capable of deriving sufficient nourishment and support from all kinds of food. The power of living in various situations would be rendered nugatory by restriction to one kind of diet.

If it was the design of nature, that the dreary wastes of Lapland, the naked and barren shores of the Icy Sea, the ice-bound coasts of Greenland and Labrador, and the frightful deserts of Terra del Fuego, should not be left entirely uninhabited, it is impossible to suppose that either a vegetable or even a mixed diet is necessary to human existence. How could roots, fruits or other vegetables be procured, where the bosom of the earth is closed the greater part of the year, and its surface either covered with many feet of snow, or rendered impenetrable by frost of equal depth? Experience shows us that the constant use of animal food alone is as natural and wholesome to the Eskimaux, the Samoiedes, and the inhabitants of Terra del Fuego, as the most careful admixture of vegetable and animal matters is to us. The Russians who winter in Nova Zembla, are obliged to drink fresh rein-deer blood, and to eat raw flesh, in order to preserve their health. Dr. Aikin informs us that these practices were found most conducive to health in those high northern latitudes. The Greenlander and the inhabitant of the Archipelago between north-eastern Asia and north-western America, eat the whale, often without waiting for cookery. The former bury a seal, when they catch one, under the grass in summer, and the snow in winter, and eat the half-frozen, half-putrid flesh with as keen a relish as we do our most delicate dainties.

In the torrid zone, on the contrary, the deficient supply of flesh is most abundantly compensated by numerous and valuable vegetable presents; by the cocoa-nut, the plantain, the banana, the sago-tree; by the potatoe, yams, cassavi, and other roots; by maize, rice and millet; and by an infinite variety of cooling and refreshing fruits. By these precious gifts nature has pointed out to the natives of hot climates the most suitable kind of nourishment; here, accordingly, a vegetable diet is found most grateful and salubrious, and animal food much less wholesome.

In the temperate regions of the globe all kinds of animal food can be easily procured, and nearly all descriptions of grain, roots, fruit, and other vegetable matters; and when taken in moderation, all afford wholesome nourishment. As we pass from these middle climes towards the poles, animal

matters are more and more exclusively taken ; towards the equator, cooling fruits and other produce of the earth constitute a greater and greater share of human diet.

Mr. Murray observes that almost everything that moves on earth, in the sea or air, has been devoured by man. In South America, nothing in the shape of life comes wrong to them ; they eat serpents, lizards and ounces ; and Humboldt has seen children drag enormous centipedes from their holes and cranch them up. At Emeraldi their delicate *morceau* is a roasted monkey. Horse flesh, in Arabia, is choice food ; elephants' flesh in India, and camels' flesh in Egypt. The Chinese devour cats, dogs, rats and serpents. The inhabitants of Cochin-China prefer rotten eggs to fresh. The Tonquinese and inhabitants of Madagascar prefer locusts to the finest fish. In the West Indies, a large caterpillar found on the palm is esteemed a luxury, while the edible nests of the Java swallow are so rich a dainty that the ingredients of the dish will cost fifteen pounds. The astronomer De la Lande was remarkably fond of spiders. In Germany, the ligneous fibres of trees, when dried, ground and sifted, so as to form an impalpable powder like coarse flour, are not only capable of affording wholesome nourishment to man or animals, but even, with some admixtures and culinary skill, constitute very palatable articles of food. Humboldt says the Ottomaques, on the banks of the Meta and the Orinoco, feed on a fat unctuous earth, or a species of pipe-clay, tinged with a little oxyd of iron. They collect this clay very carefully, distinguishing it by the taste ; they knead it into balls of four or six inches in diameter, which they bake slightly before a slow fire. Whole stacks of such provision are seen piled up in their huts. These clods are soaked in water when about to be used ; and each individual eats about a pound of the material every day. The only addition which they occasionally make to this unnatural fare, consists in small fish, lizards and fern roots. The quantity of clay that the Ottomaques consume, and the greediness with which they devour it, seem to prove that it does more than merely distend their hungry stomachs, and that the organs of digestion have the power of extracting from it something convertible into animal substance.

The diversity of substances composing the catalogue of human aliments, offers a strong contrast to the simple diet of most other animals, which, in their wild state, are confined to one kind of food, either animal or vegetable, and are often restricted to some very small part of either kingdom. Hence

it has been conceived that man also ought to confine himself to one sort—that he probably did so in his *natural state*—and that the present variety in his bill of fare is the consequence of degeneration, or departure from nature. The question of the *natural food* of man has been much agitated.

The nature of an animal is only to be learned by an observation of its structure, actions and habits. From the powerful fangs and jaws, the tremendous talons, the courage, and the vast muscular strength of the lion, and his constant practice of attacking living prey, we pronounce his nature to be ferocious, predatory and carnivorous. From evidence of the same sort, we determine the nature of the hare to be mild, timid and herbivorous. In a similar way we conclude man to be naturally omnivorous.

It is alleged in reply, that man in society is artificial and degenerate; and the object of enquiry is stated to be, what does he subsist on before civilization? Generally on animal food, the produce of the chase or the fishery; because vegetable food cannot be obtained in sufficient certainty and abundance, until settled habits of life have begun, until the arts, at least that of agriculture, have commenced. If the rudest barbarism is the most natural state of man, the New Hollanders are the most exceptionable specimens; raised, and but just raised above the level of the brutes. Is it a just point of view to regard the savage state exclusively as the state of nature? Is civilization to be considered as opposed to, and incompatible with the nature of man?

A power of improvement, of advancement in arts and sciences, is recognized in all human beings; its degree is various in individuals and races. All have lived in society, which strongly tends to promote and assist the development of this power. Social life and progressive civilization, instead of being unnatural to man, are very valuable parts of his nature, as much as the erect stature and speech; as much as ferocity and solitary life are the nature of predacious animals, or mildness and herding together are of many herbivorous ones. It is just as natural for man to form societies, build up political associations, cultivate arts and sciences, spread himself over the globe, and avail himself of both organized kingdoms for his support, as it is for the bee and ant to establish their communities, gather honey, and lay up provisions.

These considerations lead to the conclusion, that progressive advance and development, and the employment of all kinds of food, are as natural to man, as stationary uniformity and restriction to one species of aliment are to animals.



Recurring to the subject already adverted to—the extension of the great human family over the whole habitable globe, let us enquire into the causes of a phenomenon which so remarkably distinguishes man from all other animals;—this power of existing and multiplying in every latitude, and in every variety of situation and climate. Does it arise from physical endowments, from any particular capabilities of the human organization—from strength and flexibility of the animal machinery? or from the effects of human art and contrivance, in affording protection from extremes of heat and cold, winds and rain, vapors and exhalations, and the other destructive influences of local situation? Is it, in short, the result of physical constitution, or of reason? It is thought that both these causes are concerned;—that the original source of an attribute, which so strikingly characterizes our species, is to be sought in the properties of the human frame; and that this original power of the bodily fabric is assisted and fully developed by the mental prerogatives of man.

How do the Greenlander, the Eskimau, and the Canadian employ remarkable talents or invention to defend themselves against the cold? They brave the winter with open breasts and uncovered limbs; and devour their whales and seals, dressed, raw or putrid. The Negro is healthy and strong under a vertical sun, with the soles of his feet bare on the burning sands.\* On the other hand, the fox, the beaver, and other animals seek the shelter of dwellings which they dig for themselves. In this comparison, in respect to protection from external influences, man enjoys no peculiar privilege. The mind, indeed, employs the excellent structure of the body, lifts him above the rest of the creation, accommodates him to all places, gives him all the necessities and materials for comfort and defence; but, with all this, could never make him what he now is, the inhabitant of all climates, if he did not possess the most enduring and flexible corporeal frame. The lower animals, in general, have no defence against the evils of a new climate, but for the force of nature. The arts of human ingenuity furnish a defence against the dangers that surround our species in every region. Accordingly, we see the same nation pass into all the climates of the earth; reside whole winters near the pole; plant colonies beneath the equator; pursue their commerce, and cultivate their arts on the

\* The women and children on the coast of Sierra Leone wear nothing on their heads, either in rain or sunshine. The mean heat is 84°; but the thermometer rises in the sun to 130 or 140°.

various parts of the earth. They can equally live under a scorching sun and on an ice-bound soil, and inhabit regions where the hardest animals cannot exist.

Other animals, as the polar bear, naturally constructed for cold, cannot subsist in warmer regions. The dog accompanies man everywhere ; but, with all the protection and assistance afforded by his master, degenerates, and undergoes remarkable changes, both of bodily structure and other properties in very warm and very cold regions.

Other circumstances in the human economy correspond with this power of adaptation ; such are the slow growth, long infancy, and late puberty of man. In no animal but man do the sutures of the cranium close, or the teeth come out at so late a period : none is so long before it can support the body on the legs, and before it arrives at the complete adult stature. The long infancy of our species is compensated by proportionate longevity : no other of the mammalia, of corresponding size, enjoys so long a life as man.

If we add to the foregoing circumstances, that man is not provided by nature with means of defence, and consequently requires assistance ; and that his great distinctions, reason and speech, are only germs which are not developed by themselves, but are brought to maturity by foreign assistance, cultivation and education, we shall infer that he is designed by nature for social union. Such a condition appears more consonant to the structure, properties and functions of our frame, than the imaginary and most absurdly named '*state of nature*' of some philosophers. Rousseau, the great apostle of this doctrine, informs us, that the state of nature never has existed ; and he sets aside all facts as foreign to the question. With these admissions before us, we are required to believe that we have degenerated from our natural state ; that speech, society, arts, inventions, sciences, agriculture, commerce, property, civil government, and inequality of condition, have introduced all possible misery, and have debilitated our physical being ; that we should live in the woods scattered and solitary to get food enough, protect life by flight and force, satisfy our desires, and sleep. In this condition of nature, says Buffon, the first education requires an equal time as in the civilized state ; for in both, the infant is equally feeble and equally slow in its growth, and, consequently, demands the care of its parents during an equal period. In a word, if abandoned before the age of three years, it would infallibly perish. Now, this necessary and long-continued intercourse between mother and child is sufficient to communicate to it



all that she possesses ; and though we should falsely suppose that a mother, in a state of nature, possesses nothing, not even the faculty of speech, would not this long intercourse with her infant produce a language ? Hence, a state of pure nature, in which man is supposed neither to think nor speak, is imaginary, and never had an existence. This necessity of a long intercourse between parents and children, produces society in the midst of a desert. The family understand each other by signs and sounds ; and this first ray of intelligence, when cherished, cultivated and communicated, expands, in process of time, into the full splendor of reason and intellect. As this habitual intercourse could not subsist so long without producing mutual signs and sounds, those, always repeated, and gradually engraved on the memory of the child, would become permanent expressions. The catalogue of words, though short, forms a language, which will soon extend as the family augments, and will follow, in its improvement, the progress of society. As soon as society begins to be formed, the education of the infant is no longer individual ; since the parents communicate to it, not only what they derive from nature, but likewise what they have received from their progenitors, and from the society to which they belong. It is no longer a communication between detached individuals, which, as in the animals, would be limited to the transmission of simple faculties, but an institution of which the whole species participates, and whose produce constitutes the basis and bond of society.

The differences which exist between inhabitants of the different regions of the globe, both in bodily formation and in the mental faculties, are so striking that they must have attracted the attention of every observer. With those forms, proportions and colors, which we consider so beautiful in the fine figures of Greece, contrast the woolly hair, the flat nose, the thick lips, the retreating forehead and advancing jaws, and black skin of the Negro ; or the broad, square face, narrow, oblique eyes, beardless chin, coarse, straight hair, and olive color of the Calmuck. Compare the ruddy and sanguine European with the jet-black African, the red man of America, the yellow Mongolian, or the brown South Sea Islander ; the gigantic Patagonian to the dwarfish Laplander ; the highly civilized nations of Europe and America, so conspicuous in arts, science, literature, and in all that can strengthen and adorn society, or exalt and dignify human nature, to a tribe of naked, shivering and starved New Hollanders, a horde of

filthy Hottentots, or the whole of the more or less barbarous tribes of Africa. Are they all brethren? Have they descended from one stock? or more than one? If so, how many *Adams* must we admit? It is a question of fact, and must be answered from history. But history is silent; her first books have been destroyed by time, and the few lines preserved by Moses are rather calculated to excite than to satisfy our curiosity. In the first feeble rays of its early dawn, which are faintly perceived about 2000 years before the commencement of our present era, the whole of Asia, and a part of Africa, are already occupied with a variety of greater and smaller nations, of various manners, religion and language. The warlike struggle is already in full activity; here and there are polished states, with various useful inventions, developement and extension. The rest of the human race consists of wild hordes, occupied merely with pastoral pursuits, hunting and robbery; thus a kind of slave-trade is seen in the time of Abraham. Soon after, a few feeble rays of light discover to us Europe in a similar state of population, from the Don to the Pillars of Hercules; here and there traces of culture, industry and commerce, for instance, the amber trade in the Baltic, at least in the time of Homer, and that of the British tin. All this is perceived in remote obscurity, where only a few points of light occasionally shoot across to show us the germs of future history, which is still profoundly silent respecting the time and place of such events. Nothing is left for us, but humbly to assume the garb of ignorance, to look round us in the great archives of nature, and see if there are any documents which may at last lead us to conjectures. Happily there are such; but as they belong to the domain of natural history and physiology, they are necessarily deferred, and will be hereafter brought to view.

It is generally supposed, however, that our species originated from a single pair—that the diversity which is observable among them is owing to the various physical and moral causes to which they have been subsequently exposed. In the animal, as in the vegetable world, we find almost numberless varieties of form and color in the same species, some of which have no visible cause. The children of a single parent often have striking peculiarities, which they communicate to their descendants. Some of the numerous variations of complexion and constitution may be imputed to climate; and other peculiarities, as the fine form of the American Indians, or the flat heads of the tribes among the Rocky Mountains, to the treat-

ment of their infants. But there are still other varieties of form, feature and color, which, like other animals, are probably owing to causes beyond the reach of our investigations.

It is obvious, from the above considerations, that a complete and accurate arrangement of our species cannot therefore be made or expected; and that it is more consistent to adopt a general one, which will answer the purpose of classifying the facts already known, and affording points of comparison in the aid of future enquiry, than to attempt the details and minuter distinctions, for which we must depend on further investigation.

Blumenbach divides the single species which the genus *Homo* contains, into the *Caucasian*, *Mongolian*, *Ethiopian*, *American* and *Malay* varieties. He regards the Caucasian as the primitive stock. It deviates into two extremes, most remote and different from each other, viz: the Mongolian on one side, and the Ethiopian on the other. The other two varieties hold the middle places between the Caucasian and the two extremes, that is, the American comes between the Caucasian and Mongolian; and the Malay between the Caucasian and Ethiopian. This distribution appears to have exceptions; and the five varieties seem to be so many general divisions, each of them including several species.

The following remarks will serve as a general description of the five varieties.

I. CAUCASIAN VARIETY. (See Fig.) *Characters*.—A white skin, either with a fair rosy tint, or inclining to brown; red cheeks; hair black, or of the various lighter colors, copious, soft, and generally more or less curled or waving. Irides dark in those with brown skin, light (blue, gray or greenish) in the fair or rosy complexioned. Large cranium with small face; the upper and anterior regions of the former particularly developed, and the latter falling perpendicularly under them. Face oval and straight, with features distinct from each other; expanded forehead, narrow and rather aquiline nose, and small mouth; front teeth of both jaws perpendicular; lips, particularly the lower, gently turned out; chin full and rounded. Moral feelings and intellectual powers most energetic, and susceptible of the highest development and culture.

It includes all the ancient and modern Europeans and their descendants, except the Laplanders and the rest of the Finnish race; the former and present inhabitants of Western Asia as far as the river Oby, the Caspian Sea, and the Ganges, that is, the Assyrians, Medes and Chaldeans; the Sarmatians, Scy-

thians and Parthians; the Philistines, Phœnecians, Jews, and the inhabitants of Syria generally; the Tartars Proper; the several tribes actually occupying the chain of Caucasus;\* the Georgians, Circassians, Mingrelians, Armenians; the Turks, Persians, Arabians, Afghans, and Hindoos of high caste; the Northern Africans, including not only those north of the Great Desert, but even some tribes placed in more southern regions; the Egyptians, Abyssinians and Guanches.

When these numerous races are assigned to one variety, their assemblage will not be understood to indicate that they are all alike in physical and moral traits. The distribution of our species into five divisions must be regarded in a very general view; and this general conformity is not inconsistent with various and strongly marked modifications. The latter are more numerous in the Caucasian than in any other variety, perhaps from greater natural softness, delicacy, or flexibility of organization, concurring with the influence of more ancient and complete civilization. In surveying the distinctions of moral and intellectual endowments, we feel uncertain how much ought to be ascribed to original difference, and how much to the powerful influence of government, education, religion, and other analagous causes. It is thought, however, that most of the virtues and talents which adorn and ennoble man, have existed from early times in a higher degree among the Celtic and German than among the Slavonic and Original people, while the latter have usually displayed a more sensual character than the former.

This variety includes all the nations in which the intellectual endowments of man have shone forth in the greatest native vigor, have received the highest cultivation, and have produced the richest and most abundant fruits in philosophy, science and art, in religion and morals, in poetry, eloquence and the fine arts, in civilization and government, in all that can dignify and ennoble the species.

*(To be continued.)*

\* The name of this variety is derived from this mountain, because in its vicinity, and particularly towards the south, we meet with a very beautiful race of men, the Georgians; and because, so far as the imperfect lights of history and tradition extend, the original abode of the species seems to have been near the same quarter.

THE HIVE BEE.

GRAND DIVISION—*Articulated.* CLASS—*Insecta.* ORDER—*Hymenoptera.*  
GENUS—*Apis.* SPECIES—*Mellifica.*

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'The bee observe,  
She too an artist is, and laughs at man,  
Who calls on rules the slightly hexagon to form;  
A cunning architect, that at the roof  
Begins her golden work, and builds without foundation.  
How she toils! and still from bud to bud, from flower to flower  
Travels the livelong day. Ye idle drones  
That rather pilfer than your bread obtain  
By honest means like these, look here and learn  
How good, how fair, how honorable 'tis  
To live by industry. The busy tribes of bees,  
So emulous, are daily fed with heaven's peculiar manna.  
'Tis for them, unwearied alchemists, the blooming world  
Nectareous gold distils; and bounteous heaven,  
Still to the diligent and active good, their very labor makes  
The certain cause of future wealth.'

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THE natural history of the bee has, from remote antiquity, attracted the attention of philosophers, divines, moralists, and the inquisitive mind of all denominations of men. The native instinct of these insects, their uniform habits of industry and economy, their wisdom and sagacity, and the peaceful regularity which prevails in their communities, afford a subject most truly sublime and instructive, and which has in all ages been deemed a fertile source of admiration.

In their native undomesticated state, they resort for residence to cavities in hollow trees, and to the cliffs of rocks in the mountains, where they congregate in communities, propagate and rear their progeny, and store up the produce of their labor as stock in common for winter subsistence. But mankind, coveting the produce of their labors, have reduced them to the condition of domesticated animals, and share with them in the luxury which could not be obtained from any other source. An immense multitude of these animals are made subservient to the convenience of man, and are by him provided with tenements suited to their condition.

History does not inform us how nor when these interesting insects were first brought into a domesticated state. Pliny informs us that Aristomachus, of Soles, in Cilicia, devoted fifty-eight years to the study; and that Philiscus, the Thracian, spent his whole life in forests for the purpose of observing them. But in consequence of the imperfect methods of research, assuming that what they did discover was known to

Aristotle, Columella and Pliny, we are justified in pronouncing the statements of these philosophers, as well as the embellished poetical pictures of Virgil, to be nothing more than conjecture, almost in every particular erroneous. It was not indeed till 1712, when glass hives were invented by Maraldi, a mathematician of Nice, that the proceedings of bees within the hive could be known. This important invention was soon afterwards taken up by M. Reaumur, who laid the foundation of the more recent discoveries of Hunter, Schirach and the Hubers. It remains an undecided question whether the hive bee is a native of this country, or was imported from Europe. The natives called this insect the '*white man's fly*,' from which it would seem that they were unacquainted with it till the arrival of the first settlers. The admirable architecture which bees exhibit in their miniature cities has, by these and other naturalists, been investigated with great care and accuracy.

In every hive are associated three different kinds of bees;—females, males and neuters or workers. The females are styled *queens*, not more than one of which can live in the same hive, and no hive or colony can subsist long without her presence. The average number in a hive is from 15 to 20,000; about 5000 bees will weigh a pound. Of the above aggregate number, 19,499 are supposed to be neuters or working bees, 500 are drones, and the remaining one is the personage styled the queen, or mother, and she is in the strictest sense the mother and ruler of the whole hive.

The bee is no less admirable in the structure and form of its body, than wonderful in its instinct and sagacity. It is all perfect in proportion and symmetry, all harmony and combination of parts concurring to the design of its creation. On each side of its head is a large round eye. It has a long tongue, and two strong mandibles or teeth, which enable it to construct the comb and cells, and to carry from the hive all obnoxious substances. It has four wings and six legs; in the third pair of legs are two triangular cavities for the purpose of carrying to the hive little pellets or balls of pollen, which they gather from flowers. At the extremity of each of the six feet are fangs, with which they attach themselves to the sides of the hive, and occasionally to each other in clusters. Below the teeth is the *proboscis*, or trunk, (See Fig.) which is the principal organ employed in collecting honey from flowers. It has a stomach and a honey bag or second stomach, which last is of the size of a pea when filled, and is as transparent as crystal. Its head is furnished with two *antenna*, or horns, by means of



which they reciprocally obtain a knowledge of each other, of their young, and their queen, all communicated by the sense of feeling. It is by these simple organs that they are guided in the dark, and enabled to construct their comb and cells, and feed their young. When deprived of both their antennæ, they can no longer recognize objects, their instinctive faculties are lost, and like Sampson after his locks were shorn, they are feeble, helpless, and soon perish. According to the celebrated Huber's experiments on the antennæ of a queen, the amputation of one did not affect her instinct, but when both were cut off near the head she lost all her influence; even the instinct of maternity disappeared, and the workers themselves seemed to participate in the deprivation. This fact evinced that the antennæ of both parties to a recognition are necessary, and that it is not alone the mutilated one which loses the power of knowing others.

The females and neuters are furnished with a sting, (See Fig.) their arms of defence, of which the males are destitute. This is not a simple sharp-pointed weapon; it consists of two lancets, concealed in a director, which, on a slight observation, would seem to be the sting itself. The external side of each is provided with several barbs, like those of a dart, which prevent the retraction of the sting. These lancets are operated upon by muscles of uncommon strength. They have two membranous bags or ducts, which unite and form a canal, which terminates between the two strings; the latter uniting form a groove. When imposed upon by man or other animals, they pierce their stings into the flesh, inject a liquid poison into the wound, the virulence of which is sufficient to occasion death if the stings be numerous. Queens are more peaceable and less disposed to sting than the neuters.

**OF THE QUEEN BEE.** (See Fig.) The queen is distinguished from the other bees by her form and stature, being about eight lines and a half in length, while the males and neuters are less. Her abdomen is longer in proportion, and its size is augmented when filled with eggs; her wings are much shorter, and her color tends to a deeper yellow. She resides in the interior of the hive, and seldom if ever departs from her station, except when she leads out a new swarm. The government of bees is termed republican, although it resembles more the monarchical, as a single individual governs the whole. The respect and obedience with which she is honored are truly remarkable; she is almost continually attended by a circle of her subjects, who devote themselves to her service; some present her with honey, others pass their trunks

lightly over her body in order to remove from it anything that may be offensive. When she walks, those that are in her way range themselves in a respectful manner in order to let her pass. Among 20 or 30,000 bees of which a hive frequently consists, the queen is the only one from which the progeny proceeds; she is the parent of the hive, and her fecundity is astonishing. She propagates her species by means of eggs. According to Swammerdam a queen contains 50,000 eggs; and some naturalists affirm that a queen may be the mother of 100,000 bees in one season, sometimes laying 200 eggs daily. The eggs are deposited in cells, which the workers prepare in the comb for their reception; each cell is formed of a size and shape according to the kind of bee which is to be produced. Those producing workers are hexagonal and horizontal; those for drones are somewhat irregular, but the cells containing eggs intended to produce queens are large, circular, and hang perpendicularly in the hive. The queen, before depositing an egg, examines whether the cell is clean and suitable to its future condition, being aware which kind of bee will proceed from the egg she deposits. Each of the eggs for the three kinds of bees is hatched in three days to a *larva*, or worm, which lies on the bottom of the cell, surrounded by a thin, transparent fluid. The queen bee has nothing to do with feeding and nursing her young; but this duty devolves entirely upon the neuters. These may be seen feeding the larvæ with the pollen of flowers, which receive it by opening two lateral pincers. As they increase in size, they repeatedly shed their coats. After the larva is so large as nearly to fill its cell, it requires no more food, but prepares for another state called *pupa*, chrysalis, or nymph. The bees, aware of this change, cover the mouth of the cell with a substance of a light brown color. The larva then begins to line the cell with silk which it spins similar to the silk worm, and makes a kind of pod, by which it is entirely surrounded. It now casts off its last coat and enters the pupa state. It is now wonderfully changed, for there is not a vestige of the old form to be seen. How this curious change is effected is not easily determined. To bring it about many parts must be removed, out of which it would seem as if new ones were formed. Soon after the pupa is formed, which is about twenty-two days after the egg is deposited for the neuters, and about sixteen days for the queens, it breaks through its covering and comes forth a perfect bee. The cell which it occupied is immediately filled with honey.

The presence of the queen bee inspires the others with new instinct, and animates them to labor. If the queen by any means gets lost or removed, the whole hive becomes a scene of tumult and disorder. The bees seem to anticipate their own destruction, and if there be neither eggs nor brood in the cells, they will infallibly perish; their instinctive faculties will be lost; and in a short time will disappear and die. But if there be brood in the cells, they quietly pursue their labors, knowing that nature has endowed them with the power of repairing their loss. This they effect in the following manner. If there are no worms in the royal cells, they select one three days old, and having sacrificed three of the contiguous cells, they form one adapted for a royal cell; and the worm which it contains is supplied with a peculiar kind of paste or jelly, of a pungent taste, which is reserved for queens alone. By this process, a queen is produced from a worm which otherwise would have been bred a common worker; and thus by a single kind of metamorphosis of their own species they obtain a sovereign, and avert the effect of a loss which would have proved the utter ruin of the whole colony. Though the queen lays several eggs in the royal cells, which will successively be transformed into queens, one only in its mature state can exist long in the same hive; if two come forth at the same time, one must die for the welfare of the community. Nature has, therefore, inspired queens with the most deadly hatred, which nothing but actual death can appease. Huber witnessed in his glass hives many duels in which the fate of queens was decided. They rush together apparently with great fury, the antennæ are mutually seized by their fangs. The head, breast and belly of the one are opposed to the same parts of the other. The queen, which is either the strongest or the most enraged, seizes the origin of her rival's wing with her fangs, then rising above her, she curves her own body, and inflicts a mortal wound. She then withdraws her sting and quits her hold of the wing she had seized, and the victim falls down, drags herself along, and her strength declining she soon expires. During these combats the common bees are in great agitation, they certainly take a decided part, and appear to be aware that it is necessary such combats should have a fatal issue.

The extraordinary antipathy manifested by queens is not limited to their perfect state, for it extends to the nymphs yet in their cells. When a queen is hatched, she immediately seeks the cells of those that are to become her rival sisters, and uses every possible exertion to destroy them. A young

queen in a hive containing five or six royal cells, within ten minutes after her birth hastens to the cells containing other young queens. She furiously attacks the first one, commences tearing the covering, and after effecting an aperture of sufficient size, she introduces her sting, and inflicts on her approaching rival a deadly wound. The victorious young queen proceeds to attack other royal cells, until all her rival sisters are sacrificed to her jealousy.

Should a hive be deprived of the original queen, her absence is soon discovered by the other bees; and great agitation arises; all their ordinary occupations are suspended; should the queen be restored, she is instantly recognized as their sovereign, and tranquillity is the result. If a stranger queen be introduced immediately after their loss, the agitation still continues, and she meets with great opposition; she is surrounded, seized, and kept captive by an impenetrable cluster of bees, where she dies either of hunger or from the privation of air. If eighteen hours elapse before the stranger queen is introduced, she is treated with less rigor, but still is not well received. But should there be an interval of twenty-four hours before the stranger is substituted, all is quiet, she is received with favor, and her reign commences at the moment of her introduction. Huber, among his ingenious experiments, introduced a fertile queen eleven months old into a glass hive, where the bees had been deprived of their queen twenty-four hours, and had already begun to construct royal cells to supply their loss. Immediately after her introduction, the bees nearest to her touched her with their antennæ, and passing their trunks over every part of her body, and supplied her with honey. These then gave place for others, until all in succession approached their new sovereign, formed a circle around her, and performed like ceremonies.

They now vibrated their wings, and buzzed as if they experienced some agreeable sensation. In a quarter of an hour the queen began to move her original position, when the bees opened the circle at that part toward which she turned, and formed a guard around her. Some of the workers were laboring with great activity at the royal cells, supplying the royal larvæ or worms with jelly, as if still ignorant that they no longer stood in the need of them. But the queen at length repaired to that side, where she was received with the same respect and ceremony as on the other side of the comb; and what was a more decisive proof that they adopted her as their queen and mother, they immediately desisted from their work at the royal cells; they even removed the

worms, devoured the food which had been provided for them. From this moment, says Huber, the queen was recognized by all her people, and conducted herself in the new habitation as if it had been her native hive.

OF THE WORKING BEES, OR NEUTERS. (See Fig.) The working bees form the great class on which the welfare of a hive principally depends. They are much less in size than the queens or drones, being about six lines in length, and are called neuters as being supposed to be destitute of sexual characteristics; but it has been ascertained that some of them are capable of a partial fertility, but their eggs produce male bees only. The singularity of the means which the Author of nature has directed for the preservation of the species of bees, is particularly remarkable. In most other instances, the mothers are the watchful and tender nurses of their young, but in this they only give them birth. The duty of rearing the young is committed to the neuters, and they, as nursing mothers, manifest as much affection towards the young of their species, as we observe in the real mothers of other animals. They clean and prepare the cells appropriated for the larvæ of the three kinds of bees; and after the queen has deposited her eggs, the workers supply the food for the worms of each species, and seal each cell with a covering different, according to the particular worm enclosed. Nor are these the limits of their occupations; they collect all the honey, prepare the wax, construct the comb, guard the hive, and are ready to sacrifice their lives for the general good. While some are collecting honey, others are searching the flowers for pollen, which they bring home in the hollow of their legs for the young brood. Some are constantly employed in the various works within the hive, as guarding the queen, constructing the cells, and attending to the necessities of the young; while others keep a constant watch day and night at the entrance of the hive; if a stranger bee, a wasp, or noxious insect appear, it is instantly repelled or destroyed.

It is contrary to their nature to suffer any unclean substance to remain about the hive; like good scavengers, they free their dwelling of all nuisances; obnoxious animals of small size entering a hive are immediately stung to death and dragged out; larger animals which they cannot remove they kill, but carefully cover the body with propolis, or bee glue and wax, to prevent any putrid effluvia which might disturb their repose. A shell snail having crept into one of Mr. Reaumer's hives, the bees immediately surrounded it, but being unable to penetrate its shell with their stings, actually

glued up the mouth of its shell with propolis, and fixed the animal so as to be immovable. In another instance, a naked snail or slug had entered a hive, this soon expired beneath the repeated strokes of their stings, after which they covered the body with their embalming materials. On taking up a hive in autumn a few years since, the body of a mouse was found entirely encased in the substance of the comb, and so effectually embalmed as to exclude the access of atmospheric air and to obviate the possibility of annoyance from putrefaction.

'Embalmed in shroud of glue, the mummy lies,  
No worms invade, no foul miasmas rise.'

Human wisdom could scarcely devise expedients better adapted to circumstances than is observable in the foregoing examples of instinctive sagacity.

Huber furnishes the following instances showing their capability of defence against an enemy. In autumn 1804, the owners of a number of hives having suffered a great loss by the ravages of the *sphynx atropos*, resolved to protect their hives from further pillage by closing their entrances with tin gratings, with apertures proportioned to the size of the bees, but not having enough for the whole, two were left unsecured. The next morning, on examination, it was found that during the night the bees had themselves taken the necessary precautions, by contracting the entrances of their hives so as to make them quite safe against invasion. Each was completely blockaded by a wall, composed of wax and farina, in which the bees had taken care to leave apertures, corresponding to their own size: one was broad enough in front to admit of the passage of several bees at once, but was so low, that they were obliged to lean over on one side to get through. All the other hives proved on inspection, to be constructed in the same way, even those provided with the tin gratings; fifty-three swarms began these operations in the course of the same night.

An unconquerable attachment to their queen is a remarkable trait in the character of bees. Some persons have the address to her without injury, and wherever she is carried the whole swarm follow after, nor will they forsake her in any situation. So strong is their loyalty and love for their sovereign, that, in one instance, a separation was made by way of experiment, and a number of bees voluntarily refrained from food five days and nights, when they all died of famine, and the queen survived but a few hours longer, disdaining life without the company of her subjects. Even the dead



body of the queen is a subject for the respect and affection of the workers. Dr. Evans relates, that a queen in a thinly peopled hive, lay on a comb apparently dying. Six workers surrounded her, seemingly in intent regard, quivering their wings, as if to fan her, and with extended stings, as if to keep off intruders or assailants. On presenting honey, all the bees except the guards, partook of it, but they, absorbed in their mournful duty, disregarded the proffered banquet. On the following day, the queen, though lifeless, was yet surrounded by her guard; and of this faithful band of followers, not one deserted its post, until death came kindly to extinguish both its affection and its grief.

A prominent trait in the character of bees is their unrivalled habits of industry. So ardent is their native passion for flowers, and such their pleasure in making honey, that a young bee on the very day of its birth is seen in the field, passing from flower to flower, and loading its feeble legs with pollen, and its stomach with the nectareous fluid. Bees labor from the dawn of day till evening, and never cease to collect honey and wax as long as the season continues favorable.

These ingenious elaborators of wax and honey are not exempt from the passion which unhappily disturbs the peace of the human species. They discover a propensity to war for the purpose of conquest and pillage. A strong swarm will attack a weaker one, and carry the whole stock of honey to their own hive, compelling the subjugated bees to assist in the spoil. But there are some lazy, idle individuals among them called *spongers*, which obtain their subsistence by robbery; they attack a laboring bee when returning from the field loaded with honey, which they bite and tear until it vomits up its load, and then take it to themselves and make off.

OF THE DRONES. (See Fig.) These are larger than the neuters, being about seven lines in length; more sluggish in their movements; the proboscis shorter than that of the neuters, and are destitute of stings. They are known to be males, and are useful only in being instrumental in propagating their species, taking no part in collecting food, or interest in the economical duties within the hive. In pleasant weather, and in the heat of the day they take their flight, and it is then that they pair with the queen, which always results in the death of the drone. After the period of procreation, and the drones are no longer of use, they are cruelly destroyed by those very workers which formerly watched over them so carefully in their cells; and not content with this, they

attack the male pupæ in their cells, and after destroying them, suck the fluid from their bodies. The period in which the general slaughter of drones is effected, is from July to September, when their existence may be dispensed with till their places are supplied by others from their cells in April or May following. Huber, being desirous of witnessing the singular scene of carnage, placed six hives on a glass table, and placed himself and an assistant beneath it. On the 4th of July the working bees assembled, and actually massacred all the males in the whole six hives at the same hour, and with the same peculiarities. The glass table was covered with bees full of animation, which flew on the defenceless drones, seized them by the antennæ, the wings and limbs, and killed the unfortunate victims, by repeated stings directed between the rings of the belly. The moment that the formidable weapon reached them was the last of their existence; they stretched out their wings and expired.

(*To be continued.*)

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## THE VINE.

NATURAL ORDER—*Vites*. CLASS—*Pentandria*. ORDER—*Monogynia*.  
GENUS—*Vitis*. SPECIES—*Vinifera*.

—  
'The vine too her curling tendrils shoots,  
Hangs out her clusters glowing to the south,  
And scarcely wishes for a warmer sky.'

—  
THE grape vine is a trailing, deciduous shrub, with a twisted, irregular stem, flexible branches, decumbent, or supporting themselves, when near other trees, by means of tendrils. The bark is of a light or dark brown color, separating in strips from the stalks, and renewing itself annually. The leaves are generally large, but vary in form and appearance, being entire, serrated, more or less lobed, downy or smooth, of a lighter or darker shade of green, or with a reddish tinge during summer, but varying at maturity in autumn. Those varieties of which the predominating color is red, almost invariably changing to, or are tinged with some shade of that color; and those which produce white, green or yellow grapes, changing to a yellow color without being tinged with

purple, red or scarlet. The breadth of the leaves varies from five to ten inches, and the length of the stalk which supports the leaf, from four to eight inches. The flowers are produced on the shoots of the same season, which shoots generally proceed from those of the year preceding; they are of a greenish color and fragrant odor—are produced in the form of a cluster of grapes, and expand in June. The berries are of a variety of forms, of various colors, and differing also in flavor, which is poignant, elevated and grateful.

The flowers have each a five-toothed calyx, and five almost colorless petals, which fall off early; five stamens, and a superior germ, surmounted by a style and obtuse stigma.

Each berry naturally contains five heart-shaped seeds; but many varieties originating from culture have but three, others but two, and sometimes one, and there are others which have none.

The tendrils are opposite to the leaves, and may be considered as abortive clusters, and can be made to produce fruit by destroying the real clusters when they first put forth, breaking off at the same time the extremity of the shoot on which they grow, so as to cause the sap to flow into them.

The eye or bud is surrounded by three or four scaly coverings, under which, especially on the upper part, there is an adhesive substance of a white or red color, which protects it from the effect of rains and winter frosts. The fruit is of an astringent and refrigerant nature, and is composed of carbon, hydrogen and oxygen, and the juice, when fermented, produces acetic acid. It is in its wild state black, very small, with large seeds, and without flavor.

The vine may be traced back to remote antiquity, and it has been held in high estimation in all ages of the world. The cultivation of the vine was probably amongst the earliest efforts of husbandry. We read in the ninth chapter of Genesis, that one of the first acts of Noah, after being saved from the deluge, was to plant a vineyard. '*And Noah began to be an husbandman, and he planted a vineyard;*' thus plainly indicating that the planting a vineyard was, even at that early day, deemed one of the primary and most important acts of him who tilled the earth. Among the blessings held out to the Israelites as productions of the promised land, the vine is particularly mentioned—'*A land of wheat, and barley, and vines;*' and the spies which were sent into the land of Canaan to ascertain its riches, on their return bore a cluster of grapes on a girdle between them. The vine is also frequently mentioned by the ancient patriarchs and fathers, as an em-

blem representing the riches of a country, or the flourishing condition of a nation, tribe or family—*'Thou hast brought a vine out of Egypt,'* &c.; *'Thy wife shall be as the fruitful vine,'* &c. Solomon also speaks of its power to gladden the heart and to banish sorrow; and the 'generous wine' has for ages been deemed a fit oblation for fallen man to offer to the Deity, and to mingle in the sacred offerings of his homage.

Even among the heathen nations of antiquity, the vine was held in the highest esteem and veneration. The invention of wine was ascribed by the ancient Egyptians to Osiris, by the Latins to Saturn, and the Greeks elevated Bacchus to the rank of a deity, for having brought the vine from Arabia Felix; and after first cultivating it himself, he transmitted it to every country which submitted to his conquests, and taught its use and value to man. He is represented by Pliny to have been the first who ever wore a crown; and as the god of vintage and of wine, his crown is formed of the vine; and its twining branches, bedecked with clusters of fruit, is still selected as an emblem of hilarity and gladness. Even the crown of Juno was also made of the vine. Plato, one of the wisest of men, and who so particularly restrains the use of wine within reasonable bounds, and so severely censures its abuse by excess, remarks, that nothing more excellent or valuable than wine was ever granted by God to man.

To show still further that the ancients were well aware of its abuse as well as of its worth, although we find Bacchus generally represented with a countenance full of jollity, yet he is often depicted as an old man with his head encircled by the vine, to teach us that wine taken to excess will induce enervation, destroy our health and strength, and render us weak, loquacious, and childish like old men.

The vine, says Humboldt, which we now cultivate does not belong to Europe; it grows wild on the coasts of the Caspian Sea in Armenia, and in Caramania. Upper Asia is supposed to be its native country. Dr. Sickler remarks, that the Phœnicians, who had widely extended their commerce, and who frequently explored the coasts of the Mediterranean, introduced the culture of the vine into the isles of the Archipelago, and afterwards into Greece and the island of Sicily; from thence into Italy, Provence, and the territory of Marseilles, at the time they founded the city of that name. When Julius Cæsar conquered the Gauls, there were many vineyards celebrated for their produce in the republic of Marseilles, and in the province of Narbonne; and it is believed that the first vineyards of Burgundy existed in the age

of the Antonines, but the other parts of Gaul and Helvetia were destitute of them at that time. Indeed it is said that about this time a Swiss blacksmith having crossed the Alps into Italy, on his return brought back some grapes and some figs, which caused the whole nation to determine on emigrating to so desirable a country, producing such delicious fruits, and that they departed, after setting fire to their towns and villages, but were driven back in their attempt to cross the Alps by Julius Cæsar; and also a second time in attempting to cross the river Soane and go round the Alps, by Nice. According to Strabo, the vines of Languedoc and Provence produced the same kind of fruit as those of Italy, which undoubtedly sprang from the same origin. At about the year 85 the culture of the vine had become general in the southern and middle departments of France, and gradually extending itself over the other parts of Gaul, when Domitian, being informed of the great scarcity of grain in the Roman dominions, imputed it to the vast increase of vineyards in Italy and the provinces, which he thought was the cause that rendered agriculture too much neglected, and deeming also their existence to so great an extent as an incitement to sedition, from the encouragement they gave to intemperance, he issued an edict prohibiting the planting of any new vineyards in Italy, and ordering the whole (some historians say one half) of those in the provinces to be destroyed. This privation lasted about two centuries, during which no vineyards could be planted without permission of the emperor; and the provincials did not receive permission to re-plant them until about the year 280, when Probus, after numerous victories which gave peace to his empire, manifested a great desire to encourage agricultural pursuits in all the provinces, and rescinded the edict of Domitian. The renewal of this privilege appears to have been received with great satisfaction; for tradition still retained in the memory of the Gauls the great advantages that species of culture had afforded them; and the vines of Sicily, Italy, Greece, the Archipelago and Africa, were again transplanted to the provinces of Gaul, and became the origin of the innumerable varieties which now cover with vineyards the territories of France. The formation of these new plantations of the vine are said to have presented a delightful and cheering spectacle. Crowds of persons of both sexes and of all ages were seen voluntarily and enthusiastically devoting themselves to an occupation in which all could take part—to that pleasing restoration of liberty, the re-planting of vineyards. It appears also to have been

about this period (some authors say it was in 270) that the vine was planted in the northern parts of Gaul, and about the rivers Rhine, Moselle and Maine, and in Hungary. The vineyards of France had very early attained to celebrity, wines having been even exported from them to Italy in the reign of Vespasian.

About the beginning of the fourth century, Eumenius mentions the vines of the territory of Autun, which had become decayed by age, and the first plantation of which was entirely unknown; and M. D'Anville supposes the Pagus Arebrignus to be the district of Beaune, celebrated even at the present day for some of the finest vineyards of Burgundy. St. Martin planted vines in Touraine before the end of the fourth century; and St. Romi, who lived about the end of the fifth, left in his will to different churches the vineyards which he possessed in the territories of Rheims and Laon, with the slaves which he employed to cultivate them. The export of wines, however, from Bordeaux to England did not commence until about the year 1172.

It has been said that wine was introduced into England by the Romans; but if so, it could not have been till near the close of their influence, for Tacitus observes, that it was not known when Agricola commanded in the island. At the invasion of the Anglo-Saxons, however, when the country had been under the Roman dominion four hundred years, and had received, in that long period, all the encouragement which that people gave to the agriculture of their provinces, the vine, without doubt, was extensively cultivated. Vineyards are mentioned in the earliest Saxon charters, as well as gardens and orchards, and this was before the combating invaders had time or ability to make them, if they had not found them in the island. In the Cottonian Manuscripts, in the British museum, there are some delineations in a Saxon calendar, which, in the month of February, represent men cutting or pruning trees, some of which resemble vines. King Edgar, in an old grant, gives the vineyard situate at Wecet, together with the vine-dressers. In Domesday Book, vineyards are mentioned in several counties. According to William of Malmesbury, who flourished in the first half of the twelfth century, the culture of the vine had in his time arrived at such perfection within the vale of Gloucester, that a sweet and palatable wine, little inferior to that of France, was made there in abundance. In the thirteenth and fourteenth centuries, almost every large castle and monastery in England had its vineyard.



Grapes first came in demand as a table fruit at the beginning of the sixteenth century. They appear, however, to have become rare in England about the year 1560, during the reign of Elizabeth, and from that time their culture seems to have declined for a long course of years. Since the commencement of the present century, great interest has again been awakened to the culture of the vine, both among their scientific horticulturists, and among the numerous amateurs of this fruit; and grapes for the table, of the finest quality, the product of their own soil, are a regular article of sale in the London markets for nine months in a year.

The vineyards of Europe are composed solely of the varieties of a single species of vine, and that a foreign one transplanted to her soil. In our own country numerous species and varieties are everywhere met with, springing up spontaneously in our woods and prairies—nature's own gifts unaided by culture or by toil. Hence we possess not only all the advantages that France and the other wine countries enjoy, from our having already introduced the choicest varieties which those climes can boast, but this advantage is enhanced by the numerous varieties which our own country presents to us. And in a comparison of our natural situation with Persia and other countries of the East, as regards the number of species, we enjoy, by parity of reasoning, advantages tenfold those which were originally possessed by them, as they commenced the vine culture with a single species alone.

The regions which produce the wine grape have a mean annual temperature\* of  $50^{\circ}$  on the northern border, and  $59^{\circ}$  on the southern. Lines of temperature have been described by Humboldt, by observing the peculiar vegetables in different countries. He has traced the northern limit of the wine grape, where the mean annual temperature is about  $50^{\circ}$ , from near the latitude of Albany across the United States to the Pacific Ocean; not however in a straight line, for climate, although chiefly dependent on latitude, is yet much modified by other circumstances, as warm vallies, moisture of air, and richness of soil; and on the western coast of America, we find in latitude  $50^{\circ}$  a similar climate to the  $43^{\circ}$  of latitude on the eastern coast. Thus the wine grape may grow in  $50^{\circ}$  of latitude near the lakes, the Mississippi, and the Pacific Ocean,

\* By mean annual temperature is meant a medium between the extremes of heat and cold. In a climate where the thermometer in summer would rise to  $100^{\circ}$ , and in winter sink to zero or 0, the medium would be  $50^{\circ}$ . The mean annual temperature at the equator is computed to be about  $84^{\circ}$ , and that of Boston  $48.6^{\circ}$ .

while in the eastern part of New York and New England it would not thrive beyond the  $43^{\circ}$  of latitude.

We find on the other side of the Atlantic, the region of the wine grape, including France and the southern countries of Europe, extending as high as latitude  $50^{\circ}$ , and in some cases  $51$  or  $52^{\circ}$ . The southern limit of the wine grape, where the mean annual temperature is about  $59^{\circ}$ , is traced from Raleigh, in the United States, in latitude  $35^{\circ}$ , to Europe, where it passes between Rome and Florence, in latitude  $44^{\circ}$ . This line is the boundary between the grape region and that of the olive and fig, which require a higher temperature than the grape.

The banks of the Rhine produce excellent grapes, which are brought down the river in great quantities to the seaports. The festival of the *Vintage*, or the gathering of the grapes, which, like our Thanksgiving season, is intended as a manifestation of gratitude for the fruits of the earth, was celebrated with much joy by the ancient Romans, and is still observed by the people of Italy. It occurs with them about the beginning of September; in France and the south of Germany it is later.

The vine lasts to a considerable age. Although it bears at the age of three or four years plentifully, it is said that vineyards improve in quality till they are fifty years old. Pliny mentions a vine which had attained the age of six hundred years. In France and Italy there are entire vineyards still in existence and in full bearing, which were in the same condition three or four centuries ago, and have so continued ever since. It is said that in point of age the vine equals or even surpasses that of the oak.

A vineyard, associated as it is with all our ideas of beauty and plenty, is, in general, a disappointing object. The hop plantations of England and our own country are far more picturesque. In France, the vines are trained upon poles seldom more than three or four feet in height; and the 'pole-clipt vineyard' of poetry is not the most inviting of real objects. In Spain, poles for supporting vines are not used, but cuttings are planted, which are not allowed to grow very high, but gradually form thick and stout stocks. In Switzerland, and in the German provinces, the vineyards are as formal as those of France; but in Italy is found the true vine of poetry, surrounding the stone cottage with its girdle, flinging its pliant and luxuriant branches over the rustic viranda, or twining its long garland from tree to tree.

In Greece too, as well as Italy, the shoots of the vines are either trained upon trees, particularly upon the lofty elm, or supported, so as to display all their luxuriance, upon a series of props. This was the custom of the ancient vine-growers; and their descendants have preserved it in all its picturesque originality. It is said the Persian vine-dressers endeavor to make the vine run up the wall and curl over on the other side, which they do by tying stones to the extremity of the tendrils. A writer remarking upon this, thinks it may illustrate a passage in Genesis—*Joseph is a fruitful bough; even a fruitful bough by a well, whose branches run over the wall.* The vine, particularly in Turkey and Greece, is frequently made to entwine on trellises around a well, where, in the heat of the day, whole families collect themselves and sit under their shade.

The extent of the branches of the vine, in favorable situations and circumstances, equally corresponds with its produce and duration. In the hedges of Italy, and in the forests of our own country, the loftiest trees are overtopped by their twining branches, and in many instances they are wholly covered by them. Speechly mentions a vine which, in 1789, was growing in the open air, trained against a row of houses in Northallerton, Yorkshire, and which formerly covered a space of 137 square yards, and was at that time above 150 years of age, and it was judged that it would have extended, if permitted, to three or four times that space. The diameter of the stem of this vine, which died recently, was, at a short distance from the ground, fifteen inches.

Of the variety of the vine called the black Hamburgh, there are several remarkable trees in England, covering a great extent of surface, and bearing, under glass, a profusion of the finest fruit. Of these, among the most celebrated are the Hampton Court vine, and the vine at Valentines, in Essex. The Hampton Court vine is in a grape house on the north side of the palace; it covers a surface of 22 feet by 72, or 1694 square feet. It is a very productive bearer, having seldom fewer than 2000 clusters upon it every season. In 1816 there were at least 2240, weighing each, on the average, a pound; so that the whole crop weighed a ton, and merely as an article of commerce, was worth upwards of 400 pounds.

The size to which the trunk or stem sometimes grows, is so great as to have been formed into planks of fifteen inches in breadth, and also to have been used in furniture and statues. The wood is of the greatest durability; and Pliny observes that none is of a more lasting nature, and that vines were,

with propriety, in olden times, on account of their great size, ranked among trees. Both he and Threophrastus also speak of a vine which had attained a bulk sufficient to make a statue of Jupiter for the city of Apollonium; and the columns for Juno's temple at Metapont were also made of vine. The great doors of the cathedral of Ravenna were also made of vine planks, some of which are twelve feet long, and fourteen to fifteen inches in breadth.

Strabo, who lived in the reign of Augustus, mentions an old vine in Margiana, which was twelve feet in circumference, that the clusters of grapes which it bore were three feet in length. At Ecoan, near Paris, the seat of the late duke of Montmorency, is a table which was made from the body of a single vine.

Almost incredible as the magnitude to which the vine has attained in some cases may appear, it will undoubtedly equally amaze some persons to know the size to which its clusters and fruit have arrived. We have accounts of fruit and clusters of such extraordinary size as to appear incredible to our usual conception of grapes. Heutius informs us that in Crete, Chios, and other islands of the Archipelago, the vines afford bunches of grapes weighing from ten to forty pounds each. The bunch of grapes which was borne on a girdle by two of the spies on their return from the land of Canaan, has already been referred to; and the grapes of Damascus, at the present day, are often found to weigh upwards of twenty-five pounds a bunch.

Several remarkable vines existing at present in England, have been already mentioned. A collection belonging to the duke of Portland, at Welbeck, is said to comprise above a hundred kinds; and it was he who, in 1781, made a present of a bunch of grapes to the marquis of Rockingham which grew in his viney, and weighed nineteen pounds and a half. This bunch was nineteen and a half inches in the greatest diameter, four and a half feet in circumference, and twenty-one three-fourth inches in length, and was conveyed a distance of twenty miles by four men, who carried it by pairs in their turns, suspended on a staff. It was the variety of the Syrian grape, and is now found in several collections in this country.

Distinctions of the varieties of the vine have long been obscure and empiric, and there yet exists a multitude of kinds in regard to which no general points of agreement have been established, or terms and characters agreed on as permanent expressions by which they may be universally designated and recognized.

The names given by the Romans to their vines differ so much from those of modern date, that it would be difficult to recognize them, and to realize their identity with those of the present day, and a few instances only exist where they can be distinctly identified, or where the names have remained unchanged. Virgil has given us the names of some of the kinds most celebrated in his time, and Pliny is quite copious on the subject, but even his list is far from being perfect.

The collection formed by Rozier, Latapie, Chaptal and Champagny contains 550 varieties, 100 of which were figured by Redouté. The vineyard attached to the Linnæan Botanic Garden, New York, contains 513 varieties, 87 of which are natives of America. A particular description of all these varieties cannot be consistently done in a small work like this, and will not, therefore, be expected.

I shall only describe some of the most celebrated varieties of our own country.

**THE ISABELLA GRAPE.** *Vitis labrusca, v. Isabellella.* (See Fig.) This grape is said to be a native of South Carolina, and was introduced to the state of New York by Mrs. Isabella Gibbs, lady of George Gibbs, Esq. of St. Augustine, who then resided at Brooklyn, Long Island, and in honor of that lady has been called Isabella grape. It is a dark purple fruit, of a large size, oval form, and juicy, and equals some of the secondary European grapes; and for vigor of growth, and the abundance of fruit it yields, exceeds any other yet cultivated in this country, and requires no protection during the winter season. There is no grape which will yield a greater quantity on a given space, or that can be made more lucrative in cultivation for market than this kind.

It also promises to take an important stand in this country for the purpose of making wine, as it possesses the requisites to insure success in making wine of a fair quality, or for making brandy equal to that of France. The bunches may be dried as raisins with the greatest facility, and they may be preserved in dry sand, saw-dust, or any other similar substance for many months, in the most perfect state.

A peculiarity exists with regard to several of our native varieties, which is particularly exemplified in the Isabella—it is that of producing two crops of fruit on the same shoots in a year, which is frequently the case with this vine; but it seldom arrives to maturity, unless in a season when the autumnal frosts are long protracted.

(To be continued.)

## PLATINA.

CLASS—*Metallic.* GENUS—*Platinum.*

PLATINA is found among the gold washings of South America, and has also been discovered in St. Domingo, and in the Ural Mountains. It has always been found in small grains in alluvial formations; but from the character of the sands in which it is found, it is probable that its original associations are in primitive rocks. It is never found pure, but is alloyed with iron, copper, lead, osmium, rhodium, iridium and palladium; though these alloys constitute but a small part of the mass of the ore.

Its color is between steel-gray and silver-white, resembling silver, but has less lustre, and is not so white, and its ductility and malleability are very great. It is but a little softer than iron, and is the heaviest of all metals; being 21 times heavier than water. It is the least expansible by heat, most difficult to melt or to unite to oxygen. It becomes fusible in a temperature of 23,177° F. (above zero.) It is therefore preferable to all metals for pendulum rods, for inch measures, for crucibles, for reflecting telescopes, and conductors for the galvanic battery.

It being the most fixed and infusible of all metals, it is polished and used as a concave reflector in the most powerful telescopes, where glass would melt or break. For crucibles and other uses it is employed in the laboratory. It has not been much used in the arts, on account of its scarcity.

*Platina may be dissolved in nitro-muriatic acid, and will then form muriate of platina, which is a test for potash.*

ILLUSTRATION. Put a grain or two of platina into a Florence flask, and pour in a small quantity of nitro-muriatic acid and apply a little heat. It will dissolve very slowly; but in a few days muriate of platina will be formed. Dissolve a little muriate of soda (common salt) in a wine-glass, and a little saltpetre in another. Put a few drops of the muriate of platina into each, and it will produce no effect on the solution of muriate of soda, but will give a yellow precipitate from the solution of saltpetre.

APPLICATION. It is often a convenience to be able to distinguish potash from soda, without going through the long process of evaporation to dryness, and then waiting to see whether it will deliquesce or effloresce.





